

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

IRRIGATION SYSTEM, TAILWATER RECOVERY

(No.)
CODE 447

DEFINITION

A facility to collect, store, and transport irrigation tailwater for reuse in a farm irrigation distribution system.

Scope

This standard applies to the planning and functional design of irrigation tailwater recovery systems, including pickup ditches, sumps, pits, and pipelines. It does not apply to detailed design criteria or construction specifications for individual structures or components of the recovery system.

PURPOSES

To conserve farm irrigation water supplies and water quality by collecting the water that runs off the field surface for reuse on the farm.

CONDITIONS WHERE PRACTICE APPLIES

Tailwater recovery systems are suitable for use on sloping lands that are served by a properly designed and installed surface irrigation system to facilitate the conservation use of soil and water resources. They are also suitable for use in areas where recoverable irrigation runoff flows or can be anticipated under the management practices used or expected to be used.

CRITERIA

Collection facilities

Facilities for the collection of irrigation tailwater are an integral part of irrigation systems, surface and subsurface (443).

Sump or pit

A sump or pit is needed to store the collected tailwater until it is redistributed in the farm irrigation system. The desired control of water at the point where the tailwater is returned to the irrigation system shall be considered in determining the size of the sump.

Small sumps with frequently cycling pumping plants may be used where the tailwater discharges into an irrigation regulation reservoir or in to a pipeline with the flow controlled by a float valve. However, if the irrigation distribution system does not include facilities for regulating fluctuating flows, tailwater sumps shall be made large enough to provide the regulation needed to permit efficient use of the water.

Sumps must be equipped with inlets designed to protect the side slopes and the collection facilities from erosion. A dike or ditch shall be provided if necessary to limit the entrance of surface water to the designed inlet. Sediment traps shall be installed if needed.

Sump or pits shall be designed and constructed according to applicable NRCS standards and specifications.

Return facilities

All tailwater recovery systems require facilities of some kind to convey the tailwater from the storage sump to the point of reentry into the farm irrigation system. These facilities may consist of a pump and pipeline to return the water to the upper end of the field, or they may consist of a gravity outlet having a ditch or pipeline to convey the water to a lower section of the farm irrigation system.

The capacity of return facilities shall be determined by an analysis of expected runoff rates, the proposed sump storage capacity, and the anticipated use to be made of the tailwater.

If the return flow is used as an independent irrigation stream rather than as a supplement to the primary irrigation water supply, the rate of flow must be adequate for the methods of water application employed.

Pipelines, lined or unlined ditches, and pumping plants used in return facilities shall be designed and constructed according to applicable NRCS standards and specifications.

CONSIDERATIONS

Water Quantity

1. Effects on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, and deep percolation, and ground water recharge.
2. Effects on downstream flows or aquifers that would affect other water uses or users.
3. Effects on the volume of downstream flow that could cause undesirable environmental, social, or economic effects.
4. Potential use of irrigation water management.

Water Quality

1. Effects on the movement of sediment and soluble and sediment-attached substance on downstream water carried by runoff.
2. Effects of nutrients and pesticides on surface and ground water quality.
3. Effects on the movement of dissolved substances to ground water.
4. Effects on wetlands or water-related wildlife habitats.
5. Effects on the visual quality of water resources.

Endangered Species Considerations

Determine if installation of this practice with any others proposed will have any effect on any federal or state listed Rare, Threatened or Endangered species or their habitat. NRCS's objective is to benefit these species and others of concern or at least not have any adverse effect on a listed species. If the Environmental Evaluation indicates the action may adversely affect a listed species or result in adverse modification of habitat of listed species which has been determined to be critical habitat, NRCS will advise the land user of the requirements of the Endangered Species Act and recommend alternative conservation treatments that avoid the adverse effects. Further assistance will be provided only if the landowner selects one of the alternative conservation treatments for installation; or at the request of the landowners, NRCS may initiate consultation with the Fish and Wildlife Service, National Marine Fisheries Service and/or California

Department of Fish and Game. If the Environmental Evaluation indicates the action will not affect a listed species or result in adverse modification of critical habitat, consultation generally will not apply and usually would not be initiated. Document any special considerations for endangered species in the Practice Requirements Worksheet.

PLANS AND SPECIFICATIONS

Plans and specifications for irrigation tailwater recovery systems shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

OPERATION AND MAINTENANCE

An operation and maintenance plan must be prepared by the Designer for use by the owner or other responsible for operating this practice. The plan should provide specific instructions for operating and maintaining the system to insure that it functions properly. It should also provide for periodic inspections and prompt repair or replacement of damage components.